

## REMARKS

Claims 1-21 are pending. Claims 1-21 are rejected. Claims 1, 4, and 5 have been amended. No new matter has been added.

### Objection to Claim 1

Claim 1 was objected to because of an informality appearing therein. Claim 1 has been amended. Applicants assert that this informality has been remedied, and request that this objection be withdrawn.

### 35 U.S.C. 112 ¶ 1 Rejections

Claims 3-6, 16-19, and 21 are rejected under 35 U.S.C. 112 ¶ 1 as failing to comply with the written description requirement. Specifically, the rejection suggests that Claim 3's recitation of "means for determining that the microcontroller is in a sleep state" is inadequately described in the specification. Applicant respectfully disagrees.

The Examiner is respectfully directed to dependent Claim 3, which recites that an embodiment of the present invention is directed to:

The apparatus according to claim 1, wherein the gatekeeper circuit comprises means for determining that the microcontroller is in a sleep state.

Claims 4, 5, 16 and 21 recite similar limitations. Claims 17-19 are dependent on Claim 16, and recite further features of the claimed invention.

The rejection notes several portions of the specification that specifically address determining whether the microcontroller is in a sleep state, as claimed. The Examiner is respectfully directed to page 5, ln. 24-26, and page 27, ln. 13-15. The rejection suggests that these disclosures are inadequate for failing to teach, e.g., how to determine whether a clock signal is absent. Applicants respectfully assert that one having ordinary skill in the art would understand how to determine whether a clock signal is or is not absent, e.g., by using a number of well-known circuits, thereby enabling such a person to practice the embodiments of the invention recited in Claim 3 (Claims 4, 5, 16 and 21 recite similar limitations). Therefore, Applicants assert that Claims 3, 16, and 21 overcome the basis for rejection under 35 U.S.C. 112 ¶ 1. Accordingly, Applicants respectfully submit that Claims 17-19, dependent upon Claim 16, overcome the basis for rejection under 35 U.S.C. 112 ¶ 1, as they are dependent on an allowable base claim.

#### 35 U.S.C. 112 ¶ 2 Rejections

Claims 3-6 are rejected under 35 U.S.C. 112 ¶ 2 as being indefinite, for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Specifically, the rejection suggests that Claim 3's recitation of a "means for" does not determine the metes and bounds of a limitation. Applicant respectfully disagrees. Claims 4-6 are rejected by virtue of their dependency on Claim 3.

Applicants note that Claims 4 and 5 have been amended, and are no longer dependent upon Claim 3. Applicants respectfully submit that Claims 4 and 5 as amended overcome the basis for rejection under 35 U.S.C. 112 ¶.

With respect to Claim 3, Applicants assert the argument set forth previously, with respect to 35 U.S.C. 112 ¶ 1. Applicants respectfully submit that the specification provides sufficient detail to enable one of ordinary skill in the art to determine the metes and bounds of the limitations of Claim 3. Therefore, Claim 3 overcomes the basis for rejection under 35 U.S.C. 112 ¶ 2. Accordingly, Claim 6, dependent upon Claim 3, overcomes the basis for rejection under 35 U.S.C. ¶ 2, as being dependent upon an allowable base claim.

#### 35 U.S.C. 103(a) Rejections

Claims 1-21 are rejected under 35 U.S.C. 103(a) as being obvious over Profit, U.S. Patent No. 5,911,059, in view of Sedory, further in view of Microsoft.

The Examiner is respectfully directed to independent Claim 1, which, as amended, recites that an embodiment of the present invention is directed to:

An In-Circuit Emulation system, comprising:  
a microcontroller having a microcontroller clock;  
a virtual microcontroller running in lock-step synchronization with the microcontroller;  
a gatekeeper circuit coupled to the virtual microcontroller and the microcontroller; and  
a host computer running In-Circuit Emulation debug software, the host computer being in communication with the gatekeeper circuit so that halt commands and requests for data from the virtual microcontroller are passed through and regulated by the gatekeeper circuit.

Claims 13 and 21 recite similar limitations. Claims 2-12 are dependent upon Claim 1, and recite additional features of the claimed invention. Claims 14-20 are dependent upon Claim 13, and recite additional features of the claimed invention.

The rejection suggests that the combination of Profit with Sedory discloses every element of Claim 1 to such an extent that it would be obvious to one having ordinary skill in the art to adapt the device described in Profit to achieve the embodiments of the present invention recited in Claim 1. Applicant has reviewed Profit, and respectfully disagrees. Applicant contends that Profit fails to disclose a virtual microcontroller running in lock-step synchronization with the microcontroller, as claimed. Applicant further contends that Profit fails to disclose a host computer running In-Circuit Emulation debug software, as claimed.

The rejection suggests that Profit discloses a virtual microcontroller running in lock-step synchronization with the microcontroller, as claimed. However, the portion of Profit offered to demonstrate a virtual microcontroller describes a hardware simulator running on a host computer, see col. 5, ln. 63-67. Profit explains that this hardware simulator is used to emulate the target *circuitry*, which is the external circuitry that interacts with the target microprocessor, see col. 1, ln. 20-24. Profit describes the hardware simulator as being a conventional software program that simulates the electrical and logical activity of the *target circuitry* as seen by the target processor; see col. 6, ln. 25-29. From the example provided, the hardware simulator of Profit is principally a

processor model shell, which simulates activity at the target processor's pins; it does not emulate the processor's functionality, see col. 6, ln. 25-48. The hardware simulator of Profit is not a virtual microcontroller.

The rejection also suggests that Profit discloses a host computer running In-Circuit Emulation debug software. However, the portion of Profit referenced to demonstrate In-Circuit Emulation debug software does not disclose the operation of In-Circuit Emulation debug software, but rather states a generalization about what software might be running on the host computer, and provides an example of a software package for designing the target *circuitry*; see col. 6, ln. 49-60.

Similarly, Claim 13 recites, in part, that an embodiment of the present invention is directed to a method of regulating a host computer's access to a *virtual microcontroller* operating in lock-step synchronization with a real microcontroller using a gatekeeper function. As noted above, Applicants respectfully submit that Profit fails to show a virtual microcontroller operating in lock-step synchronization with a real microcontroller.

Similarly, Claim 21 recites, in part, that an embodiment of the present invention is directed to a method of regulating a host computer's access to a *virtual microcontroller* operating in lock-step synchronization with a real microcontroller using a gatekeeper function. As noted above, Applicants respectfully submit that Profit fails to show a virtual microcontroller operating in lock-step synchronization with a real microcontroller.

Therefore, Profit does not anticipate or render obvious the embodiments of the present invention recited in Claims 1, 13, and 21.

Sedory does not overcome the deficiencies of Profit. Sedory does not disclose a virtual microcontroller running in lock-step synchronization with the microcontroller, as claimed. Nor does Sedory disclose a host computer running In-Circuit Emulation debug software. Therefore, Profit, alone or in combination with Sedory, does not anticipate or render obvious the embodiments of the present invention recited in Claims 1, 13, and 21.

Applicant respectfully submits that Claims 1, 13, and 21 overcome the basis for rejection under 35 U.S.C. 103(a), and are in condition for allowance. Accordingly, Applicant respectfully submits that Claims 2-12, dependent on Claim 1, and Claims 14-20, dependent on Claim 13, overcome the basis for rejection under 35 U.S.C. 103(a), as they are dependent on allowable base claims.

Conclusion


In light of the above-listed amendments and remarks, Applicants respectfully request allowance of the remaining Claims.

The Examiner is urged to contact Applicants' undersigned representative if the Examiner believes such action would expedite resolution of the present Application.

Respectfully submitted,

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Date: 9/1, 2005

  
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